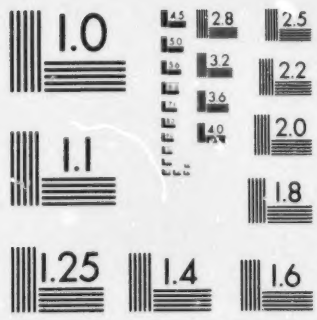


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ABSTRACT

In the past 10 years, eating disorders among adolescent females have become of increasing concern. To assess the prevalence of eating disorders, unusual eating-related behaviors and attitudes, and psychological states among college women, 677 women, from three private northeastern United States colleges, completed a questionnaire assessing depression, self-esteem, assertiveness, body image, size, and eating attitudes and behaviors. An analysis of the results showed that, although distorted eating attitudes and behaviors appeared to be fairly common, extreme responses were characteristic of a minority of the women. Of the 677 respondents, 1.5 percent could be classified as near anorexics, 3.7 percent as clinical bulimics, 3.5 percent as near bulimics, 3.5 percent as overweight, and 87.7 percent as "normals." The two bulimic groups were highest in depression and lowest in self-esteem and assertiveness. They significantly overestimated their body size, tended to weigh more than "normals," to have the most varied and bizarre methods of losing weight, and to have the greatest weight fluctuations. Each group had unique patterns of eating-related behavior, with the overweight group representing a midpoint between the "normals" and the eating-disordered. (Author/BL)

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# Eating Disorders Among College Women

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## Abstract

An eating behavior questionnaire was sent to all female students at three colleges. Distorted eating attitudes and behaviors appear to be fairly common, although extreme responses are characteristic of a minority. Of 677 respondents, 1.5% could be classified as near anorexics, 3.7% as clinical bulimics, 3.5% as near bulimics, 3.5% as overweight, and 87.7% as "normals". The two bulimic groups were highest in depression and lowest in self-esteem and assertiveness. They significantly overestimated their body size, tended to weigh more than "normals", to have the most varied and bizarre methods of losing weight, and to have the most weight fluctuations. Each group had unique patterns of eating-related behavior, with the overweight group representing a midpoint between the "normals" and the eating-disordered.

## Eating Disorders Among College Women

Eating disorders among adolescent females have become of grave concern in the last 10 years, especially the disorder of bulimia, which was indexed as a separate disorder in 1980 (DSM III[2]). The present study is an exploratory one to assess the prevalence of eating disorders and unusual eating-related behaviors and attitudes among college women. It further compares eating groups with respect to three psychological states: depression, self-esteem, and assertiveness.

A diagnosis of anorexia nervosa primarily involves the recognition of severe weight loss (at least 25% of original body weight) combined with intense fear of becoming obese, a distortion of body image, and a refusal to maintain body weight over a minimal normal range for age and height (DSM III[2]). Bulimia is a distinct syndrome involving recurrent episodes of binge eating, followed by either self-induced vomiting and/or laxative abuse, or, less frequently, fasting, excessive exercise, and/or use of amphetamines or diuretics, Bulimics appear to be preoccupied with eating and weight, and compulsive in their binging and pruging. Most bulimics are of normal weight for their height, although there may be a tendency toward overweight[13]. The typical bulimic binges at least weekly, with most binging more than once daily.[13,15,19,21,22] The number of calories consumed during a single binge can range up to 20,000.

There appears to be some striking similarities between anorexia nervosa and bulimia. Both anorexics and bulimics are overly concerned with body size, fearing fatness, but only anorexics have been found to overestimate markedly their bodily size[4,9] Many bulimics (in some studies, half) report a history of anorexia nervosa prior to gaining weight through gorging.

Furthermore, between 30-50% of all clinical anorexics also display bulimic symptomatology; i.e., they engage in food binges followed by extreme methods of purgation.[6,24] However, the nature of the binge in anorexia nervosa patients may be different, with vomiting and purging generally less frequent and habitual than in bulimia.[22]

A third eating disorder, obesity, also has links with both bulimia and anorexia. Obesity generally is defined as being more than 25% above ideal weight for height and frame. Like the bulimic, obese individuals tend to binge and eat compulsively. However, they generally do so without the resultant purgation that occurs in bulimia.[24] Like the anorexic, obese individuals tend to overestimate their body size.[11]

Most research on eating disorders has focused on clinical groups, although in recent years some exploratory work has been done to assess the prevalence and nature of binge-eating in college populations.[13,16,17,23] Estimates of the prevalence of clinical bulimia range from 3.8%-13%. For anorexia nervosa, Garner and Garfinkel[8] found an incidence rate of 7% among the high risk groups of dance and modeling students. Among college students seeking psychological help, estimates have ranged from .6% to 11%.[5,23] There have been few studies using a heterogenous college population. More exploratory work is needed to assess the prevalence not only of the clinical disorders of anorexia nervosa, bulimia, and obesity themselves, but also their related attitudes and behaviors among college students, a population at high risk.[5,15] Since women are at a much greater risk than men for all eating disorders,[4,24] they will be the focus of the present study. Anorexic attitudes and possibly-related psychological states such as depression, self-esteem, and assertiveness also will be assessed.

The clinical literat re suggests that women with eating disorders are more likely to be depressed and have lower self-esteem than noneating-disordered women.[3,4,12,22,26] Furthermore, if, as Bruch[4] and Boskind-Lodahl[3] suggest, both anorexia nervosa and bulimia are related to a lack of self-expression, these two groups may also be low in assertiveness. In contrast, overweight individuals, who may be viewed as rejecting society's ideal of the thin female physique, would not be expected to be low in assertiveness. Since it is recognized that clinically-defined eating disorders occur in a minority of college women, borderline groups also will be examined.

A questionnaire was developed to assess: 1) the prevalence of clinical cases of anorexia nervosa, bulimia, and obesity, as well as borderline states in a heterogenous sample of college women; and 2) the relationship between such categories and the psychological states of depression, self-esteem, and assertiveness.

## Method

### Subjects

Questionnaires were distributed to all female students (2207) attending three private colleges (one all-female) in northeastern U. S. One third (728) of the questionnaires were returned, and the final sample of 677 constituted those women whose questionnaires were complete and who did not have any medical problems which could affect their weight. Their mean age was 19.8 (range = 17-25 years), mean height was 64.9 inches (SD = 2.6), and mean weight was 125.6 pounds (SD = 15.7).

### Materials

On the front of a six-page booklet (available from first author) was a letter to the student explaining the intent of the study, its importance,

and the anonymity of the respondent. It was suggested that the questionnaire would take 15 minutes to complete. Measures of depression, self-esteem, and assertiveness (in that order) preceded questions relating to eating attitudes and behaviors. A measure of body image and a question of frame size concluded the booklet. To keep the questionnaire as short as possible, abbreviated measures of depression and assertiveness were used.

The measure of depressive state required respondents to describe how often they experience ten specific feelings on a five-point ("0 = Never" to "4 = Almost Always") scale. The sum of the responses chosen for the six depressive mood adjectives served as the score, with high scores (maxium = 24) indicating more depression than low scores. This measure of depression was significantly correlated ($r(28) = .48$, $p < .01$) with Form A of Lubin's[18] Depression Adjective Check List in a pilot study involving 30 ( 20 of whom were female) college students.

Self-esteem was measured by the 16-item Texas Social Behavior Inventory.[14] High scores (maximum 64) represent relatively high self-esteem.

Assertiveness was measured using 20 items selected according to face validity from Alberti and Emmons'[1] 35-item scale. These questions required respondents to indicate how often they engaged in a number of behaviors, from "0 = No/Never" to "4 = Almost Always." Total scores were obtained by summing the responses after reversing the scoring for eight statements. High scores (maxium 90) represent relatively high assertiveness.

Four questions measuring anorexia nervosa were based on DSM III criteria and were used in Garner and Garfinkel's Eating Attitudes Test:[7]

A1 I am preoccupied with a desire to be thinner.

A2 I feel that others would prefer if I ate more.

A3 I am preoccupied with the thought of having fat on my body

A4 I am terrified about being overweight.

Statements were rated on a six-point scale, from "1 = "Never" to "6 = Always."

The questions measuring bulimic symptomatology were formulated according to DSM III criteria, and are very similar to those formulated by Halmi et al.[13]

B5 I have weight fluctuations of at least 10 lbs.

B6 I am aware that my eating patterns are abnormal.

B7 I have gone on eating binges where I feel that I may not be able to stop.

B8 I binge when I am alone only (i.e., rapidly consume large amounts of food in less than two hours).

B9 How often do you binge? (Choices: more than once daily; daily; at least once a week; a few times a month; once a month or less; never).

B10 After a binge, I... (Choices: feel depressed; have abdominal pain; go to sleep; seek the company of others; induce myself to vomit; exercise strenuously; fast for an indefinite period; none of these).

B11 What foods do you eat when you are binging? (Choices: Bread/cereal pasta; cheese/milk/yogurt; fruit; meat/fish/poultry/eggs; salty snack foods; sweets; vegetables).

Questions B5 through B8 were responded to using a six-point "1 = Never" to "6 = Always" scale. For questions B10 to B12, more than one choice could be selected.

A single question measuring body image asked respondents to circle the number of one of five figure outlines which most resembled themselves at the present time. These drawings represented from left to right gradations of thinness to fatness with an ideal normal-size figure placed in the center. (Center figure was judged ideal by the majority of respondents in a pilot study.) Gradations ranged from 25% thinner than the ideal to 25% wider than the ideal figure.

A factor analysis of the four anorexic questions, the five quantifiable bulimia questions (B5 to B9), and the body deviation score, using a principal components analysis and varimax rotation[20] found three distinct factors: Factor 1 (73.2% of the variance) had high loadings from A1, A3, and A4, and can be described as a Preoccupation with Weight factor (A3 loaded highest .88); Factor 2 (16.2% of the variance), had high loadings from the bulimia questions, and can best be called a Binging factor (B7 loaded highest with .84); and Factor 3 (10.6% of the variance), consisting solely of question A2. Based on these results, A2 was discarded from the classification schema. These factors are similar to thoses found by Garner and colleagues[10] on the Eating Attitudes Test.

Procedure

Questionnaires were distributed via campus mail, except that at one college residence hall advisors also were used to distribute booklets to the females on their floor. Students had one week to return the questionnaire to a local campus box number.

The depression, self-esteem and assertiveness scales were scored by six students blind to the categorization of respondents. All categorization was done by computer according to the following criteria:

Classification criteria. On the basis of height, weight, frame size, and a chart of desirable weight ranges,[25] respondents were placed into one of five weight categories: 1) greater than or equal to 25% below desirable weight, using lower range limit; 2) between 25% and 10% below desirable weight, using lower range limit; 3) more than 10% below, using lower range limit, and less than 10% above, using upper range limit, of desirable weight; 4) 10% to 25% above desirable weight, using upper range limit; 5) greater than or equal to 25% above desirable weight, using upper range limit. These

weight categories corresponded to each of the five figure drawings in the body image question. Body deviation scores then were calculated by subtracting chosen body size from actual weight category.

Using DSM III criteria, a subject was classified as anorexic according to all of the following: 1) weight category 1; 2) a response of "often," "very often," or "always" on questions A1, A3, and A4; 3) body deviation score of at least -1 (showing overestimation). Only two respondents fit all criteria.

A slightly less extreme category of near anorexics was created by slightly modifying one or two of the criteria used for clinical anorexia nervosa: 1) weight category 1 or 2; 2) a response of at least "sometimes" on either A1, A3, or A4, and at least "often" on the other two questions; 3) body deviation score of at least -1. Eight respodents fit these criteria. Both anorexic groups were combined into one of 10 females, 1.5% of all respondents, heretofore referred to as near anorexics.

Using DSM III criteria, a subject was classified as bulimic according to all the following: 1) a response of at least "often" on questions B6 and B7; 2) a response of "at least once a week" or more frequently on B9; 3) checked "feel depressed" after a binge in B10; 4) at least three of the following:

a) a response of at least "often" for B5

b) a response of at least "often" for B8

c) checked any item in question B10 other than depression and "none";

d) checked Bread/ cereal/pasta, Salty snacks, and/or Sweets in B11

e) checked any weight loss method in B12,

Twenty-five respondents (3.7%) fell into this category.

To balance the near anorexic category, a near bulimic one was created by modifying one of the first three bulimic criteria ( the fourth critera remained the same): 1) a response of at least "sometime" to either B6 or B7; or 2) a response of "a few times a month" on B9; or 3) no depression in B10. Twenty-four women fell into this category, 3.5% of all respondents. Classification was such that if both anorexic and bulimic or near bulimic criteria were satisfied, respondent was classified as anorexic or near anorexic, in keeping with DSM III definitions.

Because only two respondents fell into weight category 5 (obese), a category of overweight was created, consisting of all respondents weighing at least 10% over the upper limit of desirable weight (categories 4 and 5) who were not either bulimic or near bulimic. This group consisted of 24 women, 3.5% of all respondents.

The category "normal" consisted of all respondents not otherwise classified: 594 women or 87.7% of the respondents.

## Results

The eating disorder groups significantly differed on all criterion variables, as shown in Table 1. A one-way analysis of variance revealed significant

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Insert Table 1 about here

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differences among eating groups on depression ($F(4, 672) = 7.238$, $p < .001$). Scheffé post hoc comparisons revealed that both bulimics and near bulimics were significantly more depressed than the "normal" group, and the bulimics were significantly mor depressed than the overweight group. Significant differences among groups also occurred on the self-esteem measure ($F(4, 672) = 3.909$, $p = .004$), with the two bulimic groups scoring lowest and the overweight group scoring highest. On assertiveness ($F(4, 672) = 2.998$, $p = .018$),

the overweight group scored significantly higher than the near bulimic group. Further analyses of variance revealed that there were no significant differences among colleges on these measures.

On the measure of body image deviation, the eating behavior groups also differed significantly ($F(4, 672) = 12.615$, $p < .001$; see Table 1 ). As expected given the classification criteria, the near anorexics overestimated their true body size more than any other group. However, Scheffe tests showed that both the bulimic and near bulimic groups also overestimated their body size more than the overweight group ( who tended toward underestimation The bulimic group also significantly overestimated their body size compared to the "normal" group.

Analyses of variance for height, weight, and weight category found significant differences among groups (see Table 1). The overweight group was significantly shorter and the anorexic group significantly taller than all other groups ($F(4, 672) = 11.171$, $p < .001$). On weight ($F(4, 672) = 19.245$, $p < .001$), the near anorexic group weighed significantly less than the bulimic and the overweight groups, and both the bulimic and near bulimic groups weighed significantly more than "normals". Of course, the overweight group weighed significantly more than all other groups. Similar results were found for the weight category analysis ($F(4, 672) = 115.537$, $p < .001$). Due to the classification criteria, the overweight group was in a significantly higher, and the near anorexic group in a significantly lower category, than everyone else. However, the bulimic group also was in a significantly higher weight category than "normals", who were mainly in the desirable weight category 3. There were no significant differences among groups with regard to frame size.

In an attempt to discover what aspects of both anorexic and bulimic behaviors were related to the criterion variables, multiple Pearson correlations were computed (see Table 2). Using a .01 level of significance due to the

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Insert Table 2 about here

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large number of multiple correlations and the large sample size, depression was found to be significantly related to a number of anorexic criteria questions: a preoccupation with a desire to be thinner and with the thought of having fat on one's body (A1 and A3), terror about being overweight (A4), and body image deviation. Depression was even more strongly related to several bulimic criteria: weight fluctuations (B5); awareness that eating patterns are abnormal (B6); occurrence of uncontrolled eating binges, frequently (B7 and B9); and probability that binging occurs when alone (B8).

Self-esteem similarly was linked to several anorexic and bulimic questions and significantly negatively related to depression. Of the anorexic criteria, self-esteem was significantly negatively related to preoccupation with a desire to be thinner and with the thought of having fat on one's body (A1 and A3), and terror about being overweight (A4). Of the bulimic criteria, self-esteem was significantly negatively related to awareness that eating patterns are abnormal (B6), occurrence of uncontrolled binges, frequently (B7 and B9), and likelihood thant binging occurs when alone (B8). The magnitude of these correlations, however, all are small ($r < .13$).

The assertiveness measure showed a similar pattern of results as the self-esteem measure, due to the significant high correlation between the two. The assertiveness measure also was significantly negatively correlated with the depression measure.

The body deviation score showed significant correlations with all anorexic and bulimic behavior questions, as well as with the depression measure. Bulimic behavior questions also are significantly associated with anorexic attitudes.

Given that nearly half of the entire sample (47%) had binged at least sometimes (B7), further analysis of binge-related behaviors was conducted. "Normals" binged significantly less frequently than all other groups, as shown in Table 3 ($F(4, 672) = 124.502$, $p < .001$). Both the bulimic and the

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Insert Table 3 about here

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near bulimic groups binged significantly more frequently than the near anorexics and the overweight, and the bulimics binged significantly more frequently than the near bulimics. A more detailed analysis of frequency of binging (B9) revealed that about half the near anorexics (50%) and overweight groups (54.1%) and 1/3 of the "normals" (34.7%) binge more than once a month. For comparison, over 3/4 of the bulimics (80%) binge weekly while the remainder binge more than once a day. The majority of near bulimics (58%) binge a few times a month, with the remainder binging weekly or daily.

During a binge, the bulimic groups tend to eat the widest variety of foods: one half binge on all the high calorie foods listed in question B11, whereas only 12.3% of the "normals", 16.7% of the overweight, and 20% of the near anorexics binge on such a bariety of foods. Bulimics and near bulimics binged when alone (B8) significantly more often than all other groups ($F(4, 672) = 68.398$, $p < .001$), with half doing so very often or always. (See Table 3.)

Behaviors following a binge (B10) also were analyzed. By definition, all bulimics get depressed after binging, but so do all near bulimics, 3/5

(61.9%) of the near anorexics, 1/4 of the overweight, and 1/5 of the "normals". The three nonbulimic groups significantly differed among themselves ($X^2(2) = 9.93$, $p < .001$). Since respondents could check more than one consequence of binging in B10, answers were clustered, as shown in Table 4. However, in the

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Insert Table 4 about here

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nonbulimic groups, most respondents engaged in only one behavior. Nearly 3/4 of the "normals" and the overweight did nothing after a binge in contrast to half of the near anorexics. Abdominal pain was most frequent among bulimics and near bulimics, suggesting that these groups may eat more during a binge than the other groups. About 1/4 of the bulimic groups vomit following a binge in contrast to less than 3% of the other groups. Sleep alone or in combination is the most likely activity following a binge for the overweight group, whereas exercise alone or in combination is the most likely activity following a binge for "normals". Fasting after a binge, either alone or in combination, occured for about half of the near anorexics and near bulimics.

Weight less methods (B12) also varied widely among groups and are listed in Table 5. The vast majority of the four eating disorder groups and 1/3

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Insert Table 5 about here

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of the "normals" have attempted to lose weight by one or more of the four extreme methods listed. All respondents who try to lose weight are most likely to try a severely restrictive diet either alone or in combination with other methods, but the bulimic groups have the most variety of weight loss methods, are most likely to use more than one method, and are most likely to use alternative methods beside extreme dieting.

Whether due to weight loss methods or other reasons, the five groups significantly differed in having weight fluctuations of at least 10 pounds (B5) ($F(4, 672) = 44.306$, $p < .001$, see Table 3). Both the bulimics and near bulimics had significantly more frequent weight fluctuations than the other groups. The overweight group also had significantly more frequent weight fluctuations than "normals".

As a whole, only 25% of the sample said they were rarely or never preoccupied with the desire to be thinner (A1). The groups significantly differed among themselves on this question, as well as on the other three anorexic questions (see Table 3; AN1 $F(4, 672) = 30.646$, $p < .001$; AN2 $F = 2.983$, $p = .018$; AN3 $F = 36.566$, $p < .001$; AN4 $F = 30.340$, $p < .001$). "Normal" and overweight students were preoccupied with the desire to be thinner and with the thought of having fat on their bodies significantly less frequently than all other groups. "Normal" and overweight students also were significantly less ikely than the eating-disordered groups to be terrified at the thought of being overweight. As expected, near anorexics were significantly more likely than overweight students to say that others would prefer if they ate more.

Over half (52.7%) of the entire sample rarely or never were aware that their eating patterns are abnormal (B6). As shown in Table 3, the groups significantly differed among themselves on this question ($F(4. 672) = 61.741$, $p < .001$), with "normals" having this awareness significantly less frequently than all other groups, and the overweight having this awareness less frequently than the eating-disordered groups. Thus, most women who had an eating disorder were aware of it.

## Discussion

The results of the eating disorder survey suggest that attitudes and

behaviors associated with the clinical syndromes of anorexia nervosa and bulimia are relatively common among college women. Nearly half of all women had binged at least sometimes, with the median frequency of binges once a month or less frequently. About 10% followed this binge with some form of purge. Three fourths of all college women at least sometimes had the desire to be thinner, 2/3 at least sometimes were preoccupied with the thought of having fat on their body, and half were at least sometimes terrified about being overweight. Half also at least sometimes were aware that their eating patterns are abnormal, and 2 out of 5 resort to extreme methods to lose weight. However, only a relatively small percent of the respondents could be considered to be suffering from a severe eating disorder. Such clinical and borderline groups appear to represent "typical" attitudes and behaviors taken to an extreme.

The number of clinical and near anorexic nervosa students was very small, constituting only 1.5% of all respondents. This percentage compare favorably with that found in a sample of students seeking psychological help-- .6%[23]-- but may still be an underestimation of the problem. The small numbers may due to self-selection, whereby students suffering from anorexia nervosa may be less likely than other students to return a self-report questionnaire on their eating behaviors and attitudes. Reports in the clinical literature suggesting than anorexia nervosa patients are particularly high in interpersonal distrust and lack of self-awareness[12] supports this possibility. It is also possible that the classification criteria were too rigid even for the near anorexic group. The DSM III criteria were operationalized so that only if two out of the three anorexic attitudes were held at least "often" was a person classified as anorexic or near anorexic. "Sometimes" having these attitudes was not sufficient. Similarly, some body image distortion was necessary to receive an anorexic or near anorexic classification since it

is a major DSM III criterion for the syndrome. However, Garner and Garfinkel[9] report that not all clinical anorexic patients overestimate body size. When body overestimation was removed as a criterion, 11 more females fell into the near anorexic group, bringing the total to 3.1% of the respondents. The effects on the criterion variables were similar.

Self-selection may also be why only two clinically obese students returned the questionnaire. The overweight group, although useful to compare with the other groups, can not really be considered representative of an eating disorder.

The frequency of bulimia among college students depends upon the conservativeness of the criteria used. In the present study, 3.7% of respondents could be clinically diagnosed, a rate comparable to that found by Stangler and Printz[23] among a university patient population, and that found by Katzman et al.[17] among a nonclinical sample of college women. However, Halmi et al.[13] found an incidence rate of 13% among college students. The discrepancy is probably due to the less stringent criteria used by Halmi et al., since their questionnaire used "yes/no" responses, whereas the present study categorized on the basis of frequency. Combining the near bulimic group with the bulimics makes 7.2% of the respondents. Even more students would be found if only occasional binging and purging were used, as done by Johnson[15], who found rates between 15-20%.

As the clinical literature suggests, students classified as bulimic and near bulimic were the most depressed and lowest in self-esteem. Near anorexics also had high depression and low self-esteem scores [4,12] These two psychological states are significantly correlated with most of the anorexic and bulimic attitude and behavior statements.

Although scores on assertiveness were in the predicted pattern (low for

the anorexic and bulimic groups, high for the overweight), the difference was significant only betweem the near bulimics and the overweight. These results support the perception of overweight women as rejecting society's "thin" female ideal, whereas women suffering from both anorexia and bulimia may be excessively accepting of it [3,8]. Low scores on assertiveness are significantly correlated with a preoccupation with and terror regarding the thought of being overweight, frequency of eating binges especially when alone, and awareness that eating patterns are abnormal.

Ironically, occurence of uncontrolled eating binges is significantly and strongly correlated with preoccupations about thinness, fat, and overweight. Thus, although they frequently eat well past the point of satiation to actual pain, both groups of bulimics also are extremely concerned with dieting and weight loss methods. In fact, it may be this concern plus the fact that they do tend to weigh more than "normals" that makes their repertoire of weight loss methods the most bizarre of all groups. Halmi et al.[13] also found a tendency for bulimic college students toward overweight.

Interestingly, none of the students in the bulimic groups relied solely on vomiting to lose weight, although about 25% used it in combination with another weight loss method. Considerably more (about 40%) rely on laxatives or diurectics. Indeed, most bulimics do not vomit right after a binge, unlike the findings of Mitchell et al.[19,21] who found more than 90% of their clinical cases doing so. However, other reports of college samples also find other forms of purgation besides vomiting dominating the bulimic's repertoire[13,16]. It may be that vomiting is indicative of greater pathology, or that the group-living situation in which most college women reside does not afford the necessary privacy for that form of purgation.

Purging seems to differentiate both bulimic groups from the overweight

group. Although these three groups weigh more than "normals" and all engage in binging behavior at least a few times a month, the overweight group is less likely than the bulimic groups to take active stops following a binge; they are more likely just to go to sleep. Perhaps that is why they weigh even more than the bulimic groups. Overweight women also may eat less during a binge than both groups of bulimics, as indicated by the very small percentage (4.2%) of overweight women who experience abdominal pain following a binge compared to the sizable percentage of bulimics (33-40%).

About half of the sample of near anorexics appear to have bulimic symptomatology. They at least sometimes binge and follow their binges with fasting. These percentages appear similar to these found with hospitalized groups of anorexics.[6]

An unexpected finding was the overestimation of body size by the bulimic group compared to the "normal" group. Previous research has not suggested any body image distortion among clinical bulimics, although Halmi et al.[13] did find that among college students, affirmative responses to the bulimia questions were positively associated with the distorted belief of weighing more than actual weight. In the present study, similar significant correlations were found betweem body size overestimation and all of the anorexic and bulimic questions, particularly a preoccupation with thinness and fat, weight fluctuations, and awareness that eating patterns are abnormal. Research with anorexics suggests that their body size overestimation may be related to an abnormal sensitivity to body size, to a "surviving perception of maximum ever weight and size", and/or to low self-esteem.[9] The role of body size distortion in bulimia merits more attention.

The trend toward underestimation of body size among the overweight also was unexpected, but may be accounted for in two ways. First, they were not

a clinical group and therefore findings related to overestimation among obese patients may not be relevant.[11] Secondly, the results may be an artifact of the measure of body image distortion used. Only five figures were presented, which did not allow obese individuals to overestimate their size. Neither did it allow clinically anorexic students to underestimate their size. An extension of the scale in both directions is needed.

In general, there is much overlap of behaviors and attitudes between bulimics and anorexics, except for the lower weight of the anorexics and the more frequent binging and purging of the bulimics. Some credence is thus given to clinical reports that many bulimics have a history of anorexia nervosa.[21] There is also support for a link with obesity as well, [4,13,24] since binge-eating occurs in all three forms of eating disorders, and many bulimics and anorexics previously were overweight. In the current study, the overweight group was not a clinical one; instead they appear to represent a midpoint betweem those behaviors and attitudes characteristic of most college women, and those that appear characteristic of pathological groups. It is hoped that more research into how these groups become pathological will help to develop not only remedial but preventative programs as well.

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Table 1

Mean Scores (and SD) by Eating Group

| Group | N | Depression*** | Self-Est.** | Assertion* | Body Dev.*** | Weight *** | Weight Cat.*** | Height *** |
|---|---|---|---|---|---|---|---|---|
| "Normals" | 595 | 6.8 | 43.9 | 56.2 | -.09 | 124.2 | 2.9 | 64.9 |
| | | (2.9) | (9.0) | (8.8) | (.66) | (14.3) | (.3) | (2.5) |
| Near Anorexics | 10 | 9.0 | 39.1 | 53.6 | -1.30 | 117.5 | 1.7 | 67.8 |
| | | (4.6) | (8.7) | (10.8) | (.95) | (12.3) | (.5) | (2.0) |
| Bulimics | 25 | 9.2 | 39.0 | 53.6 | -.52 | 135.3 | 3.2 | 65.0 |
| | | (4.2) | (12.3) | (12.4) | (.87) | (20.1) | (.6) | (3.2) |
| Near Bulimics | 24 | 8.8 | 38.9 | 52.1 | -.42 | 132.9 | 3.0 | 65.1 |
| | | (4.1) | (11.2) | (9.1) | (.58) | (15.4) | (.5) | (2.7) |
| Over-weight | 24 | 6.6 | 44.8 | 60.0 | .21 | 147.5 | 4.1 | 62.0 |
| | | (2.8) | (11.3) | (9.4) | (.78) | (21.5) | (.3) | (3.5) |

*$p < .05$. **$p < .01$. ***$p < .001$

Table 2

Diagonal Matrix of Pearson Correlations [a] Among All Variables

| | SE | Assert. | A1 | A2 | A3 | A4 | B5 | B6 | B7 | B8 | B9 | Body |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depres. | -.46 | -.39 | .19 | .06 | .20 | .22 | .21 | .26 | .22 | .22 | -.21 | -.12 |
| SE | | .68 | -.10 | .03 | -.12 | -.11 | -.06 | -.12 | -.11 | -.13 | .11 | .08 |
| Assert. | | | -.07 | .02 | -.11 | -.11 | -.02 | -.09 | -.14 | -.12 | .18 | .07 |
| A1 | | | | .02 | .82 | .63 | .38 | .40 | .40 | .43 | -.34 | -.28 |
| A2 | | | | | .08 | .15 | -.02 | .12 | -.01 | -.02 | .08 | .20 |
| A3 | | | | | | .71 | .37 | .44 | .43 | .44 | -.37 | -.24 |
| A4 | | | | | | | .39 | .44 | .39 | .40 | -.32 | -.14 |
| B5 | | | | | | | | .48 | .42 | .34 | -.28 | -.24 |
| B6 | | | | | | | | | .50 | .41 | -.38 | -.23 |
| B7 | | | | | | | | | | .66 | -.58 | -.18 |
| B8 | | | | | | | | | | | -.56 | -.20 |
| B9 | | | | | | | | | | | | .15 |

Note: Letter/number headings related to individual questions as listed under Method. SE = self-esteem, Body = Body deviation.

[a] Correlations greater than .05 are significant at $p < .05$, greater than .08 are significant at $p < .01$, and greater than .11 are significant at $p < .001$.

Table 3

Means (and SD) for Specific Questions by Eating Group

| | AN1 | AN2 | AN3 | AN4 | B5 | B6 | B7 | B8 |
|---|---|---|---|---|---|---|---|---|
| Group | ** | * | ** | ** | ** | ** | ** | ** |
| "Normals" | 3.4 (1.4) | 1.8 (1.1) | 2.9 (1.4) | 2.6 (1.5) | 2.0 (1.2) | 2.7 (1.6) | 1.7 (.9) | 1.7 (1.0) |
| Near Anorexic | 5.4 (.8) | 2.6 (2.4) | 5.3 (.9) | 4.9 (1.3) | 2.6 (1.6) | 5.1 (1.2) | 2.7 (1.7) | 2.1 (1.4) |
| Bulimic | 5.5 (.8) | 1.8 (1.3) | 5.2 (1.0) | 4.7 (1.4) | 4.6 (1.7) | 5.6 (.7) | 5.3 (.6) | 4.5 (1.5) |
| Near Bulimic | 5.4 (.8) | 2.1 (1.4) | 5.0 (.9) | 4.9 (1.3) | 4.4 (1.8) | 5.1 (1.0) | 4.3 (1.2) | 4.3 (1.4) |
| Over weight | 4.2 (1.4) | 1.2 (.7) | 3.8 (1.8) | 3.2 (1.6) | 3.1 (2.0) | 3.8 (1.7) | 2.4 (1.6) | 2.3 (1.5) |

Note. Letter/number headings correspond to questions as listed under Method.

*$p < .05$. **$p < .001$

Table 4

Behavior After a Binge By Eating Group (Percent)

| | Normal | Near Anorex. | Bulimic | Near Bulimic | Over-weight |
|---|---|---|---|---|---|
| None | 70.0 | 50.0 | 12.0 | 0.0 | 75.0 |
| Pain, alone or in combination | 8.9 | 20.0 | 40.0 | 33.5 | 4.2 |
| Vomit, alone or in combination | 2.7 | 0.0 | 20.0 | 24.0 | 0.0 |
| Sleep, alone or in combination | 8.1 | 20.0 | 20.0 | 16.6 | 12.5 |
| Seek others, alone or in combination | 5.9 | 10.0 | 20.0 | 16.7 | 0.0 |
| Exercise, alone or in combination | 12.2 | 10.0 | 24.0 | 33.5 | 8.3 |
| Fast, alone or in combination | 4.7 | 50.0 | 36.0 | 50.0 | 8.4 |

Note. Behavior categories overlap.

Table 5

Weight Loss Methods Used by Eating Groups (Percent)

| | Normal | Near Anorex. | Bulimic | Near Bulimic | Over-weight |
|---|---|---|---|---|---|
| None | 64.8 | 10.0 | 4.0 | 4.2 | 29.2 |
| Extreme diet, alone or in combination | 31.5 | 90.0 | 92.0 | 95.9 | 58.4 |
| Vomit, alone or in combination | 2.6 | 0.0 | 24.0 | 25.0 | 0.0 |
| Laxatives/diuretics, alone or combined | 2.4 | 20.0 | 44.0 | 37.6 | 8.4 |
| Amphetamines, alone or in combination | 5.9 | 20.0 | 48.0 | 37.5 | 16.7 |

Note. Methods used overlap.